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PROGRAM LIBRARY

DECUS NO.	8-549
TITLE	POLYNOMIAL LEAST SQUARES FIT
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DATE	June 28, 1972
SOURCE LANGUAGE	PS/8 FORTRAN

POLYNOMIAL LEAST SQUARES FIT

DECUS Program Library Write-up

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This program is written in PS/8 FORTRAN and calls for one subroutine that has been compiled and with the use of the linking loader has been linked to the main program and both have been stored together as one core image program. The program is stored on deck tape and is stored with the .SV extension. All I/O will be on the teletype.

When the program has been called and has started, the first question asked is, "HOW MANY POLYNOMIALS OF DIFFERENT DEGREES?" respond with the number of different desired polynomials in I2 format. This number cannot be larger than 12.

Next is, "HOW MANY DATA POINTS?"; "WHAT DEGREE POLYNOMIAL?"; and "HOW MANY DIFFERENT VALUES OF Y FOR EACH X?" These three variables are in an I2 format. It is necessary to have both the maximum number of X's and Y's for the first request since there will be only one reading of the data. If there is only 1 value of Y, so state; otherwise, a 0 will be assumed. Again, there can be only a maximum of 12 values for each X and 3 values of Y for each X. The maximum order of the equation is dependent on the data, and size of values will depend on the Nth degree. This will vary and is best to experiment to see what is the Nth degree for a given set of data. It has been noted that an 8th degree has been the Nth degree for most data. This is arbitrary, however.

Next is the input of the numeric data. These are entered in an F10.0 format. Enter all values between the up arrows () since they are spaced 9x apart. If no weighting is desired, enter a 1 there since a 0 is the default value. First enter the X value then the weight factor and then the Y values (1 through 3 depending).

After all data has been entered, the output will follow. Time will vary on the degree of polynomial requested. If an overflow error happens, try re-entering the data and requesting that degree polynomial only. If the error persists, the Nth degree has been reached one back of that.

The program will exit to the PS/8 monitor when completed with output.

HOW MANY POLYNOMIALS OF DIFFERENT DEGREES? 03

HOW MANY DATA POINTS, WHAT DEGREE POLYNOMIAL AND
HOW MANY DIFFERENT VALUES OF Y FOR EACH X?

050103

050201

040301

X	WEIGHT	Y
0.0	1.0	2.5
0.5	1.0	3.1
1.0	1.0	3.5
1.5	1.0	6.7
2.0	1.0	6.1
		8.1
		8.1
		11.7
		11.4
		12.0

NUMBER OF GIVEN DATA POINTS = 5

DEGREE OF POLYNOMIAL = 1

0 DEGREE COEFFICIENT= 0.2120000E+01

1 DEGREE COEFFICIENT= 0.4320000E+01

0 DEGREE COEFFICIENT= 0.2200000E+01

1 DEGREE COEFFICIENT= 0.4500000E+01

0 DEGREE COEFFICIENT= 0.2280000E+01

1 DEGREE COEFFICIENT= 0.4320000E+01

NUMBER OF GIVEN DATA POINTS = 5

DEGREE OF POLYNOMIAL = 2

0 DEGREE COEFFICIENT= 0.2577143E+01

1 DEGREE COEFFICIENT= 0.2491428E+01

2 DEGREE COEFFICIENT= 0.9142861E-00

NUMBER OF GIVEN DATA POINTS = 4

DEGREE OF POLYNOMIAL = 3

0 DEGREE COEFFICIENT= 0.2499999E+01

1 DEGREE COEFFICIENT= 0.1800029E+01

2 DEGREE COEFFICIENT= 0.3599946E+01

3 DEGREE COEFFICIENT=-0.1599976E+01
